

研究论文

万木林自然保护区2种天然林及杉木人工林凋落量及养分归还

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摘要 通过对福建建瓯万木林自然保护区内以观光木 (*Tsoongiodendron odorum*, TSO) 和细柄阿丁枫 (*Altingia gracilipes*, ALG) 为建群种的2种天然林及杉木 (*Cunninghamia lanceolata*, 29年生) 人工林凋落量与养分归还为期3a(2000~2002年)的研究表明, 3种林分年均凋落量 ($t \cdot hm^{-2}$) 范围从杉木人工林的4.63到观光木林的6.74。叶所占比例范围为62%~69%。细柄阿丁枫林凋落量每年只出现1次峰值(3月份或4月份), 观光木林的出现2次(3月份、6~8月份), 而杉木林的则出现3次(3月份或4月份、6~8月份和11~12月份)。3种林分Ca和Mg年归还量大小排序与按总凋落量的不同。除杉木人工林的Ca年归还量最大外, 其余养分年归还量均以观光木天然林的最大。通过凋落物各组分的养分归还中, 落叶是养分归还的主体。与针叶树人工林相比, 天然林的凋落量大、养分归还量高, 具有良好维持地力的能力。因此, 保护和扩大常绿阔叶林资源已成为南方林区实现森林可持续经营的重要措施之一。

关键词 凋落物; 养分归还; 观光木; 细柄阿丁枫; 杉木

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Litter production and nutrient return in two natural forsts and a *Cunninghamia lanceolata* plantation in Wanmulin Nature Reserve

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Abstract Litterfall represents a major biological pathway for element transfer from vegetation to soils. Seasonal variations in litter production and litter nutrient return affect stand nutrient cycling. Although considerable data exist for litter production and nutrient cycling in different forest ecosystems of the world, relatively few studies were carried out in forests of southern China. The primary purpose of this study was to determine litter production, seasonal dynamics and nutrient return in two natural forests of *Tsoongiodendron odorum* (TSO) and *Altingia gracilipes* (ALG), and an adjacent 29-year-old plantation of Chinese fir (*Cunninghamia lanceolata*, CUL) in Wanmulin Nature Reserve in Jianou, Fujian, during a period of 2000-2002. Mean annual total litterfall over 3 years of observations varied from 4.63 $t \cdot hm^{-2}$ in the CUL to 6.74 $t \cdot hm^{-2}$ in the TSO; of total litterfall, the leaf contribution ranged from 62 % to 69 %. Litterfall in the ALG showed a unimodal distribution pattern with a peak in March or April of each year, while for the TSO, the litterfall peaks occurred in March and June-August. Litterfall in the CUL peaked in March (or April), June-August and November (or December), respectively. The rank order of the three forests, according to Ca and Mg returns from total litterfall, was different from the order when rank was according to total mass of litterfall. The highest annual Ca returns from total litterfall were noticed in the CUL. The amounts of N, P, K and Mg potentially returned to the soil were the highest in the TSO. The leaf fraction provided greater potential returns of N, P, K, Ca, and Mg to the soil than other litter fractions. The results of this study demonstrate that natural forests have a greater capability for

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r maintaining site productivity than the monoculture coniferous plantation due to higher amount of aboveground litter coupled with greater nutrient returns; therefore conservation of natural forests is recommended as a practical measure in forest management to realize sustainable development of forestry in mountainous areas of southern China.

Key words [litterfall](#) [_](#) [nutrient](#) [return](#) [_](#) [Tsoongiodendron](#) [odorum](#) [_](#) [Altingia](#) [gracilipes](#) [_](#) [Cunninghamia](#) [lanceolata](#)

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